of the objects in view. As, in the Italian sky the golden orb sank with the dark planet spot on its disk, under brightly tinted clouds, shaded off in streaks of tender grey into the azure above, with the blue rose-tipped mountains of the Esterets beneath,—the scene was one as fascinating in beauty as it was interesting in science. All these tints appeared distinctly, albeit aintly, in the telescopic image on the card.

One point was remarkable,—that whilst the shades of the mountains were all *blue*, the dark round spot of the planet on the sun was almost *black*. It was the darkest object in the field of view. Partly, but I hardly think entirely, this may be explained by its being higher, and less subjected to the decomposing power of the lower atmospheric layers. I have endeavoured to represent in water-colours this view of the transit of Venus. The result, of course, cannot be reproduced in print, but any of your readers who may be visitors at Cannes will be welcome to see it, as an original kind of reminiscence of a very rare event. C. J. B. WILLIAMS

Cannes, December 21

The Comet during the Last Month

SINCE my last communication (see NATURE, vol. xxvii. p. 110) the weather and the presence of moonshine has been unfavourable for views of the comet; but I have seen it, more or less distinctly, on seven nights, from November 22 to December 21. I will not take up your space with details, but mention, as the general result of these observations, that the comet has become smaller in dimensions, and much fainter in its light. With moonlight, no trace of a tail is visible; and the nucleus can only be discerned by telescope as a nebulous star of third magnitude. In absence of moonlight, as on December 6, 8, and 12, between 2 and 3.30 a.m., the tail was visible to a length of about 10°, with a breadth expanding from the head, with no distinguishable outline. My last view of it was on the 20th, at 3 a.m., when, with a brilliant starlight after moonset, the comet was in the south-south-east, about 20° above the horizon, with a tail about 8° long, and a nucleus, a nebulous star of third or second magnitude. Its position was about as far to the east-north-east of Procyon as that star is east-south-east of Sirius. It seems likely to be visible in clear moonless nights for two or three weeks longer. C. J. B. WILLIAMS

Cannes, December 21

The Heights of Auroras

THE observations described in your last number as having been made long since in Siberia, of lunar halos projected on auroras, have not, I believe, been confirmed by other observers; but if correct, possibly this phenomenon may be a peculiarity of auroras in Siberia, or in the Arctic regions. There seems reason to think (see Capron's "Auroræ," pp. 37-40) that auroras may be lower when near the magnetic pole than further south. If this is the case, it is so far favourable to the theory (propounded, I think, by a German writer) described in NATURE (Vol. xxv. p. 320), that the auroral zone is a plane, and not part of a sphere concentric with the earth's surface. The majority of the observations in lower latitudes cited in Capron's "Auroræ," place the phenomenon at a height of 100 miles or upwards.

The height of the spindle-shaped object seen in the aurora of November 17 is thus no argument against its auroral character, which I see no reason to doubt. It is true that in my experience (which, in this northern part of the country is probably much greater than that of your correspondents), I have never seen anything resembling it, judging from the descriptions of it; but I do not think this is a reason for supposing such an auroral phenomenon could not take place. The fact that it moved along a parallel of magnetic latitude is a very strong argument for its auroral character. Besides, its spectrum is stated to have exhibited the characteristic auroral line. I hope some one will collect all possible observations of this beam, especially from the continent, and undertake a careful investigation into its path and height. T. W. BACKHOUSE

Sunderland, December 23

The Aurora and its Spectrum

IN reference to Mr. Ralph Abercrombie's letter (NATURE, vol. xxvii. p. 173), I may mention that his remarks quite accord with an opinion expressed to me by my friend, H. R. Procter, that the "aurora is generally formed in some imperfect mist or vapour." I am intending some experiments on discharges *in vacuo* under such conditions and reduced temperatures, also on phosphorescence, in connection with which M. Lecoq de Boisbaudran has shown in his "Spectres lumineux," that we get a line in the red, brightening as the temperature is reduced. I do not read the result of my Swan lamp experiment, as Mr. Munro (same number and page) does. The lamp, when perfect, gave quite a bright white glow, with a strong carbon spectrum. I should therefore attribute the absence of the nitrogen spectrum at this time not so much to a high spectrum as to the probability that the lamp had been, as far as possible, exhausted of air, and filled with some form of carbon gas. I am not aware of any air-vacuum point at which the nitrogen bands or lines disappear, except for want of light in the discharge. With regard to the letter of W. M. F. P. on the "Meteor of November 17th," I only assumed the correctness of the figures and heights quoted in mine for the purpose of showing the complex nature of the auroral questions. I am not the less perfectly satisfied that the "beam" was a true aurora, and not a meteor, my spectroscopic observation of it putting this beyond a doubt. J. RAND CAPRON

Guildown, December 23

The Weather

IT is curious how the recent auroræ have been followed not only by a cold wave, but by a subsequent warm one, and these respectively of such extremes, that 21° at 9 a.m. on the 11th is this day replaced by 48° or 27° of difference. Equally strange have been the effects on animal and vegetable life. During the cold, an almost Arctic season in its ice-bound stillness prevailed, and a flock of wild geese crossing in front of the house (the forerunners, in public opinion, of a hard winter) represented external creature life. Now all is changed almost to spring. Roses, though somewhat nipped by the frost, seem ready to blow; flies and gnats are unthawing, and last night, in going up to the observatory, I noticed the phosphorescent glimmer of a luminous centipede under one of the shrubs, a sight I do not remember ever to have met with in winter before. J. RAND CAPRON

Guildown, December 19

A Common Defect of Lenses

A CHANCE observation a few weeks since led me to the discovery of a serious defect in the object-glass of the collimator of a spectroscope by Grubb, of Dublin, which I have been using for some time. As further investigation has shown me that the defect is very common, while at the same time it is a source of considerable error in all experiments on the plane of polarisation of polarised light, it seems worth while to call the attention of readers of Nature to it. The object-glass in question has been imperfectly annealed. As a consequence, a plane polarised incident beam is elliptically polarised on emergence from it.

If it be looked at between crossed Nicols in a pencil of parallel rays, the field of view becomes bright, and is crossed by two brushes hyperbolic in form, which for two positions of the lens became two straight lines. If again plane polarised light be allowed to pass through the lens while it is turned round its own axis, there are four positions of the lens for which the central portion of the emergent beam is plane polarised, and can be quenched by an analysing Nicol; for all other positions of the lens, the emergent beam is elliptically polarised, and the light cannot be quenched, but reduced to a minimum. Moreover, as the lens is turned, the position of the axes of the ellipse varies by nearly half a degree. I have since examined a large number of lenses, without finding one quite free from the defect. One well-known London optician declines to attempt to supply me with a two-inch object-glass which shall not show it, while another states he has never known any lens absolutely free from it.

The important bearing of the point on all investigations into the polarisation of light is obvious. The consequences it produces in modifying the results of some recently-published experiments of mine (*Phil. Trans.*, Part ii., 1882) formed the subject of a paper read at the last meeting of the Royal Society.

R. T. GLAZEBROOK

Trinity College, Cambridge, December 20

New Deep-Sea Fish from the Mediterranean

MY letter in NATURE, vol. xxv. p. 535, called forth two important notes from such competent ichthyologists as Mr. J. Y.

Johnson and Dr. Th. Gill (NATURE, vol. xxvi. pp. 453, 574), to both of whom a reply is due, and should have been given sooner had I not been absent from Florence and otherwise engaged.

Firstly, I must correct my assertion as to the occurrence of *Malacocephalus lævis* in the Mediterranean; after having examined the type specimen and that mentioned by Mr. Johnson, both in the British Museum and after a further examination of my specimens, which I had considered as young *Malacocephali*, I have now not the slightest doubt that they are quite distinct. They are an undescribed and most interesting form of Macrurids allied to *Coryphænoides*, which I propose calling *Hymenocephalus italicus*. I have in my possession six specimens, both adult and young; in two of the former I have found the ovaries fully developed with mature ova.

As to the "singular fish of a deep black colour with small eyes, a naked skin, and a most abyssal physiognomy," which I got at Messina, it has no connection whatever with *Chiasmodon niger*, but is, as I before assserted, a Stomiatid, very different from all the known forms, including Dr. Günther's *Bathyophis*. It stands apart in many respects, and is the type of a new genus and perhaps of a new section of that singular family. I intend shortly to describe and figure it under the name of *Bathophilus nigerrimus*, along with other strange fish collected during my deep-sea and ichthyological researches in the Mediterranean.

HENRY HILLYER GIGLIOLI

R. Zoological Museum, Florence, December 17

Electrical Phenomenon

ON retiring to bed shortly after midnight on the 13th inst., I experienced a phenomenon which, though not of itself uncommon, was, I think, unusually developed. On pulling off a flannel vest which I wear next my skin, over my head, I became conscious of a strange sensation in the latter, accompanied by a distinct crackling noise, and bright sparks which were plainly visible in the dimly lighted room. To make sure that I was not the subject of a delusion, I repeated the operation many times, in each case rubbing the flannel half-a-dozen times—not more—against my hair. Not only were the same phenomena observable every time, but also if, after removing the flannel I then approached my knuckles to that part of it which had been in contact with the hair, a whole volley of sparks passed between the flannel and each knuckle at a distance of not less than *two inches*. As often as I repeated the experiment, so often did the phenomena repeat themselves, until I at length retired to bed not altogether without apprehension, that I might awake in the night with the bed-clothes on fire, by reason of the discharge of some extra big spark between my hair and a convenient blanket. No such catastrophe, however, occurred, and on repeating the operations the next morning, I could not reproduce the phenomena. The next evening I again repeated the experiment, and this time by very violent rubbing could just get a faint discharge between the flannel and knuckles when almost in contact. On other nights since these I have not succeeded in getting any such effect, or at most a very feeble one. To what, then, am I to attribute the marked difference of the first night? Was it due to something peculiar in the condition of the hair, the air, or the flannel? Perhaps some of your readers can suggest. As regards the first of these I ought to state that it had, on the afternoon of the 13th, been subjected to the operations of cutting, shampooing, and brushing "by machinery," at the hands of the barber. That was, however, seven hours earlier in the day, and any electricity developed by the friction of the last operation ought to have been dissipated long before twelve o'clock—especially as the night was damp and misty.

A. J. K.

29, Victoria Road, Finsbury Park, December 19

PHOTOGRAPHING THE CORONA[1]

PROBLEMS of the highest interest in the physics of our sun are connected, doubtless, with the varying forms which the coronal light is known to assume, but these would seem to admit of solution only on the condition of its being possible to study the corona continuously, and so to be able to confront its changes with the other variable phenomena which the sun presents. "Unless some means be found," says Prof. C. A. Young, "for bringing out the structures round the sun which are hidden by the glare of our atmosphere, the progress of our knowledge must be very slow, for the corona is visible only about eight days in a century, in the aggregate, and then only over narrow stripes on the earth's surface, and but from one to five minutes at a time by any one observer" ("The Sun," p. 239).

The spectroscopic method of viewing the solar prominences fails, because a large part of the coronal light gives a continuous spectrum. The successful photograph of the spectrum of corona taken in Egypt, with an instrument provided with a slit, under the superintendence of Prof. Schuster during the solar eclipse of May 17, 1882, shows that the coronal light as a whole, that is the part which gives a continuous spectrum, as well as the other part of the light which may be resolved into bright lines, is very strong in the region of the spectrum extending from about G to H. It appeared to me, therefore, very probable that by making exclusive use of this portion of the spectrum it might be possible under certain conditions, about to be described, to photograph the corona without an eclipse.

In the years 1866-68 I tried screens of coloured glasses and other absorptive media, by which I was able to insolate certain portions of the spectrum with the hope of seeing directly, without the use of the prism, the solar prominences (*Monthly Notices*, vol. xxviii. p. 88, and vol. xxix. p. 4). I was unsuccessful, for the reason that I was not able by any glasses or other media to isolate so very restricted a portion of the spectrum as is represented by a bright line. This cause of unsuitableness of this method for the prominences which give bright lines only, recommends it as very promising for the corona. If by screens of coloured glass or other absorptive media the region of the spectrum between G and H could be isolated, then the coronal light which is here very strong would have to contend only with a similar range of refrangibility of the light scattered from the terrestrial atmosphere. It appeared to me by no means improbable that under these conditions the corona would be able so far to hold its own against the atmospheric glare, that the parts of the sky immediately about the sun where the corona was present would be in a sensible degree brighter than the adjoining parts where the atmospheric light alone was present. It was obvious, however, that in our climate and low down on the earth's surface, even with the aid of suitable screens, the addition of the coronal light behind would be able to increase, but in a very small degree, the illumination of the sky at those places where it was present. There was also a serious drawback from the circumstance that although this region of the spectrum falls just within the range of vision, the sensitiveness of the eye for very small differences of illumination in this region near its limit of power is much less than in more favourable parts of the spectrum, at least such is the case with my own eyes. There was also another consideration of importance, the corona is an object of very complex form, and full of details depending on small differences of illumination, so that even if it could be glimpsed by the eye, it could scarcely be expected that observations of a sufficiently precise character could be made to permit of the detection of the more ordinary changes which are doubtlessly taking place in it.

These considerations induced me not to attempt eye-observations, but from the first to use photography, which possesses extreme sensitiveness in the discrimination of minute differences of illumination, and also the enormous advantage of furnishing a permanent record from an instantaneous exposure of the most complex forms. I have satisfied myself by some laboratory experiments that under suitable conditions of exposure and development a photographic plate can be made to record minute differ-

[1] "On a method of Photographing the Solar Corona without an Eclipse." Paper read at the Royal Society by William Huggins, D.C.L., LL.D., F.R.S., December 21.